IN THE CLAIMS

The status of the claims is listed below:

Claims 1-83: (Canceled).

84. (Previously Presented): A process for producing an alumina coating comprised mainly of α crystal structure, comprising:

coating a base material with a metal component comprising Al and Ti and one or more of B, C, N and O to form a primary coating,

oxidizing the primary coating to form an oxide-containing layer, and

forming an alumina coating comprised mainly of α crystal structure on the oxide-containing layer.

85. (Previously Presented): The process according to Claim 84, wherein the outermost surface side of the oxide-containing layer is substantially comprised of alumina.

86. (Previously Presented): The process according to Claim 84, wherein the primary coating comprises TiAlN.

87. (Previously Presented): The process according to Claim 84, wherein the primary coating comprises a nitride, cemented carbide, carbonitride, boride, nitroxide, or carbonitroxide comprising Al and Ti, and at least one element selected from the group consisting of elements of the groups IVa (except Ti), Va, and VIa and Si.

88. (Previously Presented): The process according to Claim 84, wherein the primary coating comprises TiA1CrN.

89. (Previously Presented): A process for producing an alumina coating comprised mainly of α crystal structure, comprising:

coating a base material with a metal component comprising Al and one or more of B, C, N and O to form a primary coating,

oxidizing the primary coating to form an oxide-containing layer, and

forming an alumina coating comprised mainly of α crystal structure on the oxide-containing layer.

90. (Previously Presented): The process according to Claim 89, wherein the primary coating is comprised of a nitride, cemented carbide, carbonitride, boride, nitroxide, or carbonitroxide comprising Al and at least one element selected from the group consisting of elements of the groups IVa, Va, and VIa and Si.

91. (Previously Presented): A process for producing an alumina coating comprised mainly of α crystal structure, comprising:

coating a base material with a metal whose standard free energy for oxidation generation is greater than that of aluminum and a compound of one or more of B, C, N, O to form a primary coating,

oxidizing the primary coating to form an oxide-containing layer, and

forming an alumina coating comprised mainly of α crystal structure on the oxide-containing layer.

92. (Previously Presented): The process according to Claim 91, wherein the metal whose standard free energy for oxidation generation is greater than that of aluminum is Ti.

93. (Previously Presented): The process according to Claim 91, wherein one or two or more laminate layers selected from the group consisting of TiN, TiC and TiCN are formed as the primary coating.

94. (Previously Presented): The process according to Claim 91, wherein a composition gradient layer of both material constituting elements to be connected is formed in a connecting interface between the primary coating and the base material, or layers of the primary coating.

95. (Previously Presented): The process according to Claim 91, wherein a titanium oxide-containing layer is formed as the oxide-containing layer and, in the following formation of alumina, an alumina coating is formed while being accompanied by reduction of the titanium oxide on the surface of the layer.

96. (Previously Presented): The process according to Claim 91, wherein a TiO_2-containing layer is formed as the oxide-containing layer and, in the following formation of alumina, an alumina coating is formed while being accompanied by reduction of TiO_2 to Ti_3O_5 on the surface of the layer.

97. (Previously Presented): A process for producing an alumina coating comprised mainly of α crystal structure comprising:

(1) forming at least one of the following coatings (a)-(c) on a base material:

(a) a coating comprised of a pure metal or alloy:

(b) a coating comprised mainly of a metal solid-dissolving nitrogen, oxygen, carbon or boron:

(c) a coating comprised of a metal nitride, oxide, cemented carbide or boride comprising nitrogen, oxygen, carbon or boron insufficient to a stoichiometric composition,

(2) oxidizing the surface of the coating from (1), and

(3) forming an alumina coating comprised mainly of α crystal structure on the oxidized surface from (2).

98. (Previously Presented): The process according to Claim 84, wherein the oxidizing is carried out in an oxidizing gas-containing atmosphere while retaining a base material temperature at 650-800°C.

99. (Previously Presented): The process according to Claim 84, wherein the forming of the alumina coating is performed by a PVD method.

100. (Previously Presented): The process according to Claim 84, wherein the oxidizing the surface of the primary coating and the forming of the alumina coating are carried out within the same apparatus.

101. (Previously Presented): The process according to Claim 84, wherein the coating of the base material, oxidizing the primary coating, and forming the alumina coating are successively carried out within the same apparatus.

102. (Previously Presented): A process for producing an alumina coating comprised mainly of α crystal structure on a base material, comprising gas ion bombarding the surface of a base material, oxidizing the resulting surface, and then forming an alumina coating comprised mainly of α crystal structure.

103. (Previously Presented): The process according to Claim 102, further comprising, prior to gas ion bombarding, forming a primary coating comprising one or more of a compound of one or more elements selected from the group consisting of elements of the groups 4a, 5a and 6a of the periodic table, Al, Si, Fe, Cu and Y and one or more elements of C, N, B and 0 and a mutual solid solution of these compounds.

104. (Previously Presented): The process according to Claim 103, wherein the primary coating comprises one or more members selected from the group consisting of Ti(C,N), Cr(C,N), TiAl(C,N), CrAI(C,N) and TiAICr(C,N).

105. (Previously Presented): The process according to Claim 102, wherein the base material is a steel product, a cemented carbide, a cermet, a sintered cBN or a sintered ceramic.

106. (Previously Presented): The process according to Claim 102, wherein the gas ion bombarding is performed within a vacuum chamber while applying a voltage to the base material in a gas plasma.

107. (Previously Presented): A process for producing an alumina coating comprised mainly of α crystal structure on a base material, comprising metal ion-bombarding the surface of a base material, oxidizing the resulting surface, and then forming an alumina coating comprised mainly of α crystal structure.

108. (Previously Presented): The process according to Claim 107, wherein the metal ion bombarding is performed by generating a metal plasma in a vacuum chamber while applying a voltage to the base material.

109. (Previously Presented): The process according to Claim 107, wherein the metal ion bombarding is performed by generating a plasma of Cr or Ti from a vacuum arc evaporation source while applying a voltage to the base material in the vacuum chamber.

110. (Previously Presented): The process according to Claim 107, wherein the oxidizing step is carried out in an oxidizing gas-containing atmosphere while retaining the base material temperature at 650-800°C.

Claims 111-114: (Canceled).

115. (Previously Presented): The process according to Claim 89, wherein the oxidizing is carried out in an oxidizing gas-containing atmosphere while retaining a base material temperature at 650-800°C.

116. (Previously Presented): The process according to Claim 89, wherein forming the alumina coating is performed by a PVD method.

117. (Previously Presented): The process according to Claim 89, wherein oxidizing the primary coating and forming the alumina coating are carried out within the same apparatus.

118. (Previously Presented): The process according to Claim 89, wherein the process of forming the primary coating, the process of oxidizing the surface of the primary coating, and the process of forming the alumina coating comprised mainly of α-type crystal structure are successively carried out within the same apparatus.

119. (Previously Presented): The process according to Claim 91, wherein the oxidizing is carried out in an oxidizing gas-containing atmosphere while retaining a base material temperature at 650-800°C.

120. (Previously Presented): The process according to Claim 91, wherein forming the alumina coating is performed by a PVD method.

121. (Previously Presented): The process according to Claim 91, wherein oxidizing the primary coating and forming the alumina coating are carried out within the same apparatus.

122. (Previously Presented): The process according to Claim 91, wherein forming the primary coating, oxidizing the primary coating, and forming the alumina coating are successively carried out within the same apparatus.

123. (Previously Presented): The process according to Claim 97, wherein the oxidizing is carried out in an oxidizing gas-containing atmosphere while retaining a base material temperature at 650-800°C.

124. (Previously Presented): The process according to Claim 97, wherein forming the alumina coating is performed by a PVD method.

125. (Previously Presented): The process according to Claim 97, wherein oxidizing the primary coating and forming the alumina coating are carried out within the same apparatus.

126. (Previously Presented): The process according to Claim 97, wherein forming the primary coating, oxidizing the primary coating, and forming the alumina coating are successively carried out within the same apparatus.